WHAT IS CLAIMED IS:

1. In an overall system in which a boring tool is moved through the ground within a given region along a path and in which region a cable is buried, a method comprising the steps of:

transmitting a boring tool locating signal from the boring tool;

transmitting a cable locating signal from the cable such that the boring tool locating signal and the cable locating signal are distinguishable each from the other

measuring intensities of the boring tool locating signal and the cable locating signal in a predetermined way using a locator;

establishing a pitch orientation of the boring tool; and

using the measured intensities and established pitch orientation, determining a positional relationship to relative scale including at least the boring tool and the cable in said region.

2. The method of claim 1 wherein said boring tool locating signal exhibits a forward locate point at the surface of the ground and wherein the positional relationship is determined including the forward locate point in scaled relation to the boring tool and the cable.

3. The method of claim 1including the step of displaying the positional relationship.

4. The method of claim 3 wherein said boring tool locating signal exhibits a forward locate point at the surface of the ground and wherein the step of displaying the positional relationship includes the step of simultaneously displaying at least one distance between the boring tool and the forward locate point and another distance between the boring tool and the cable.

5. The method of claim 3 wherein the display step includes the step of depicting a plan view illustrating the positional relationship to scale.

6. The method of claim 3 wherein the display step includes the step of depicting an elevational view illustrating the positional relationship to scale.

7. In an overall system in which a boring tool is moved through the ground within a given region along a path and in which region a cable is buried, a method comprising the steps of:

transmitting a boring tool locating signal from the boring tool which locating signal exhibits a forward locate point at the surface of the ground;

transmitting a cable locating signal from the cable such that the boring tool locating signal and the cable locating signal are distinguishable each from the other;

using a locator, finding the forward locate point;

establishing a drilling direction extending through the forward locate point;

moving the locator along a locating direction to a first point;

at the first point, measuring a first set of intensities of the boring tool locating signal and the cable locating signal and establishing a reference angle as an angle $\delta$ defined between the drilling direction and the locating direction,

moving the locator along the locating direction from the first point to a second point;

at the second point, measuring a second set of intensities of the boring tool locating signal and the cable locating signal.;

establishing a pitch orientation of the boring tool; and

using the measured first and second sets of intensities and the established pitch orientation, determining a positional relationship to relative scale including at least the boring tool and the cable in said region.

8. The method of claim 7 wherein the positional relationship is defined within a horizontal xyz coordinate system having an origin defined at the location of the boring tool such that an xy plane is horizontal with an x axis coincident with the drilling direction while a z axis is orthogonal to the xy plane and an s coordinate system is defined having an origin coincident with the forward locate point and extending within the xy plane in said locating direction at the angle $\delta$ with respect to the drilling direction, and wherein the s coordinate of a point $s_3$, having xyz coordinates $x_3,y_3,z_3$ directly above the cable and along said locating direction is determined by using the equations

$$\tan\gamma = \frac{b_{v_1}}{b_{u_1}}$$

$$s_1^2 = (x_1 - x_{LP})^2 + y_1^2$$
$$s_2^2 = (x_2 - x_{LP})^2 + y_2^2$$

$$s_3 = s_1 + \frac{D_c}{\cos\gamma}\frac{b_{w1}}{b_{h1}}$$
$$x_3 = x_{LP} + s_3\cos\delta$$
$$y_3 = s_3\sin\delta$$

$$\varepsilon = 90^0 + \gamma$$
$$z_3 = D_T$$

where $\gamma$ is an angle defined at the first point between the locating direction and a normal to the cable in the xy plane, $b_{v_1}$, $b_{w_1}$ *and* $b_{u_1}$ are components of the cable locating signal determined at the first point where $b_{v_1}$ is an intensity component normal to the locating direction in the xy plane, $b_{w_1}$ is an intensity component normal to the xy plane and $b_{u_1}$ is an intensity component parallel to the locating direction in the xy plane, $s_1$ represents the s coordinate of the first point, $s_2$ represents the s coordinate of the second point, $x_1,y_1$ represents the xy coordinates of the first point, $x_2,y_2$ represents the xy coordinates of the second point, $x_{LP}$ represents the x coordinate of the forward locate point, $D_c$ is the depth of the cable and $D_T$ is the depth of the boring tool.

9. The method of claim 8 wherein the locating direction is generally coincident with the drilling direction in a plan view.

10. The method of claim 7 wherein the locating direction is generally normal to the drilling direction in a plan view.

11. The method of claim 7 including the step of selecting the locating direction as one of a first direction that is coincident with the drilling direction and a second direction that is normal to the drilling direction based on which of the first and second directions bisects the cable, in plan view, more closely approaching normal.

12. The method of claim 7 wherein the locating direction is generally normal to the cable in plan view.

13. The method of claim 12 wherein the cable locating signal includes a flux line orientation measured in a horizontal plane which is normal to the cable in plan view and the method includes the step of establishing the locating direction based on the flux line orientation measured in the horizontal plane.

14. The method of claim 7 wherein the first and second points are to one side of said cable nearest the locator in a plan view.

15. The method of claim 7 wherein the first and second points are on opposite sides of said cable with the second point nearest the locator in a plan view.

16. The method of claim 7 wherein the forward locate point and the boring tool are on opposite sides of the cable in a plan view.

17. The method of claim 7 wherein the first point is selected as the forward locate point.

18. The method of claim 7 wherein the second point is selected as the forward locate point.

19. The method of claim 7 wherein the step of determining the positional relationship includes the steps of

establishing a forward distance between the forward locate point and overhead point above the boring tool measured in a horizontal xy coordinate system,

measuring a depth of the boring tool in a selected way, and

determining a set of coordinate locations in the xy coordinate system for the first and second points based on the reference angle of the locating direction, the forward distance, established pitch of the boring tool, the depth of the boring tool, and the measured intensities of the boring tool locating signal and the cable locating signal at each of the first and second points.

20. The method of claim 19 wherein the locator includes a magnetometer and wherein the step of establishing the reference angle of the locating direction includes the step of reading the reference angle using the magnetometer.

21. The method of claim 19 wherein the step of determining the depth of the boring tool includes the steps of

with reference to a third point on the surface of the ground, measuring the intensity of the cable locating signal at a first height;

moving the locator to a second height where the first and second heights are vertically spaced apart with respect to one another vertically from the third point,

measuring the intensity of the cable locating signal at the second height, and

calculating the depth of the boring tool based on the intensity measurements at the first and second heights.

22. The method of claim 21 wherein the third point is generally vertically above the cable.

23. The method of claim 21 wherein the third point is horizontally displaced with respect to any point that is generally vertically above the cable.

24. In an overall system in which a boring tool is moved through the ground within a given region along a path and in which region a cable is buried, said locating signal exhibiting a forward locate point at the surface of the ground, a method comprising the steps of:

transmitting a boring tool locating signal from the boring tool;

transmitting a cable locating signal from the cable such that the boring tool locating signal and the cable locating signal are distinguishable each from the other;

measuring intensities of the boring tool locating signal and the cable locating signal in a predetermined way using a locator;

establishing a pitch orientation of the boring tool; and

using the measured intensities and established pitch orientation, displaying a scaled positional relationship including at least the boring tool, the forward locate point and the cable in said region.

25. In an overall system in which a boring tool is moved through the ground within a given region along a path and in which region a cable is buried, a locating arrangement comprising:

a first arrangement for transmitting a boring tool locating signal from the boring tool;

a second arrangement for transmitting a cable locating signal from the cable such that the boring tool locating signal and the cable locating signal are distinguishable each from the other;

a locator for measuring intensities of the boring tool locating signal and the cable locating signal in a predetermined way and being configured for establishing a pitch orientation of the boring tool and for using the measured intensities and established pitch orientation to determine a positional relationship to relative scale including at least the boring tool and the cable in said region.

26. The locating arrangement of claim 25 wherein said boring tool locating signal exhibits a forward locate point at the surface of the ground and wherein the positional relationship is determined including the forward locate point in scaled relation to the boring tool and the cable.

27. The locating arrangement of claim 26 wherein the locator includes a display arrangement for displaying the positional relationship to scale.

28. The locating arrangement of claim 27 wherein said boring tool locating signal exhibits a forward locate point at the surface of the ground and wherein the display arrangement is configured for simultaneous display of at least one distance between the boring tool and the forward locate point and another distance between the boring tool and the cable.

29. The locating arrangement of claim 27 wherein said display arrangement is configured for depicting a plan view illustrating the positional relationship.

30. The locating arrangement of claim 27 wherein the display arrangement is configured for depicting an elevational view illustrating the positional relationship.

31. In an overall system in which a boring tool is moved through the ground within a given region along a path in a drilling direction and in which region a cable is buried, a locating arrangement comprising:

a first arrangement for transmitting a boring tool locating signal from the boring tool which locating signal exhibits a forward locate point at the surface of the ground in the drilling direction;

a second arrangement for transmitting a cable locating signal from the cable such that the boring tool locating signal and the cable locating signal are distinguishable each from the other;

a locator configured for (i) measuring intensities of the boring tool locating signal, (ii) finding the forward locate point, (iii) after having moved the locator in a locating direction from the forward locate point to a first point, measuring a first set of intensities of the boring tool locating signal and the cable locating signal, (iv) after moving the locator again in the locating direction from the first point to a second point, measuring a second set of intensities of the boring tool locating signal and the cable locating signal, (v) establishing a pitch orientation of the boring tool along with a reference angle $\delta$ that is defined between the drilling direction and the locating direction, and (vi) using the first and second sets of measured intensities, the established pitch orientation and the reference angle $\delta$, determining a positional relationship to relative scale including at least the boring tool and the cable in said region.

32. The locating arrangement of claim 31 wherein the positional relationship is defined within an xyz coordinate system having an origin defined at the location of the boring tool such that an xy plane is horizontal with an x axis coincident with the drilling direction while a z axis is orthogonal to the xy plane and an s coordinate system is defined having an origin coincident with the forward locate point and extending within the horizontal xy plane in said locating direction at the angle $\delta$ with respect to the drilling direction, and wherein the locator is configured for determining the s coordinate of a point $s_3$, having coordinates $x_3, y_3, z_3$ directly above the cable and along said locating direction by solving the equations

$$\tan\gamma = \frac{b_{v_1}}{b_{u_1}}$$

$$s_1^2 = (x_1 - x_{LP})^2 + y_1^2$$
$$s_2^2 = (x_2 - x_{LP})^2 + y_2^2$$

$$s_3 = s_1 + \frac{D_c}{\cos\gamma}\frac{b_{w1}}{b_{h1}}$$
$$x_3 = x_{LP} + s_3\cos\delta$$
$$y_3 = s_3\sin\delta$$

$$z_3 = D_T$$

where $\gamma$ is an angle defined at the first point between the locating direction and a normal to the cable in the xy plane, $b_{v_1}$, $b_{w_1}$ *and* $b_{u_1}$ are components of the cable locating signal determined at the first point where $b_{v_1}$ is an intensity component normal to the locating direction in the xy plane, $b_{w_1}$ is an intensity component normal to the xy plane and $b_{u_1}$ is an intensity component that is parallel to the locating direction in the xy plane, $s_1$ represents the s coordinate of the first point, $s_2$ represents the s coordinate of the second point, $x_1,y_1$ represents the xy coordinates of the first point, $x_2,y_2$ represents the xy coordinates of the second point, $x_{LP}$ represents the x coordinate of the forward locate point, $D_c$ is the depth of the cable and $D_T$ is the depth of the boring tool.

33. The locating arrangement of claim 31 wherein the locator is configured for determining the positional relationship based on the locating direction being selected as generally coincident with the drilling direction in a plan view.

34. The locating arrangement of claim 31 wherein the locator is configured for determining the positional relationship based on the locating direction being selected as generally normal to the drilling direction in a plan view.

35. The locating arrangement of claim 31 wherein the locator is configured for determining the positional relationship based on selecting the locating direction as one of a first direction that is coincident with the drilling direction and a second direction that is normal to the drilling direction where selection is based on which of the first and second directions bisects the cable, in plan view, more closely approaching normal.

36. The locating arrangement of claim 31 wherein the locator is configured for determining the positional relationship based on the locating direction being selected as being generally normal to the cable in a plan view.

37. The locating arrangement of claim 36 wherein the cable locating signal includes a flux line orientation measured in a horizontal plane which is normal to the cable in plan view and the locator is configured for establishing the locating direction based on the flux line orientation measured in the horizontal plane.

38. The locating arrangement of claim 31 wherein the locator is configured for determining the positional relationship based on the first and second points being to one side of said cable nearest the locator in a plan view.

39. The locating arrangement of claim 31 wherein the locator is configured for determining the positional relationship based on the forward locate point and the boring tool being on opposite sides of said cable in a plan view.

40. The locating arrangement of claim 31 wherein the locator is configured for determining the positional relationship based on the first and second points being on opposite sides of said cable.

41. The locating arrangement of claim 31 wherein the locator is configured for determining the positional relationship based on the first point being selected as the forward locate point.

42. The locating arrangement of claim 31 wherein the locator is configured for determining the positional relationship based on the second point being selected as the forward locate point.

43. The locating arrangement of claim 31 wherein the locator is further configured for determining a depth of the boring tool and for determining a set of coordinate locations for the first and second points using (i) the reference angle $\delta$, (ii) a forward distance between the forward locate point and an overhead point above the boring tool measured in a horizontal xy coordinate system, (iii) the depth of the boring tool, (iv) the pitch of the boring tool and (v) the measured intensities of the boring tool locating signal and the cable locating signal at each of the first and second points.

44. The locating arrangement of claim 43 wherein the locator includes a magnetometer for use in establishing the reference angle.

45. The locating arrangement of claim 43 wherein the locator is configured for determining the depth of the boring tool using a first signal strength measured at a first operator determined distance generally vertically above a particular surface position on the ground and a second signal strength measured at a second operator determined distance generally vertically above said particular surface position and configured for determining a depth of the cable using the first and second signal strength measurements and the first and second operator determined distances.

46. The locating arrangement of claim 45 wherein the locator is configured for using the first and second signal strengths measured generally vertically above the cable.

47. The locating arrangement of claim 45 wherein the locator is configured for using the first and second signal strengths as measured horizontally displaced from any point on the surface of the ground which is vertically above the cable.

48. In a system for locating an in-ground cable in a region using a cable locating signal which is transmitted from the length of the cable, a method comprising the steps of:

using a locator, sensing a first locating signal strength at a first operator determined distance generally in vertical alignment with an overhead surface position which is generally overhead of the cable;

measuring the first operator determined distance from the overhead surface position;

moving the locator to a second operator determined distance from the overhead surface position generally in vertical alignment with the overhead surface position;

sensing a second locating signal strength at the second operator determined distance;

measuring the second operator determined distance from the overhead surface position; and

determining the depth of the cable using the first and second signal strengths and the first and second distances.

49. The method of claim 48 wherein the steps of measuring the first and second operator determined distances each include the step of ultrasonically detecting distance to the surface of the ground using said locator.

50. The method of claim 48 wherein the depth of the cable is determined using the expression

$$D_c = \frac{h_2 b_2 - h_1 b_1}{b_1 - b_2}$$

where $D_c$ is the depth of the cable, $b_1$ and $b_2$ are the first and second locating signal strengths of the locating field, respectively, at the first and second operator determined distances given as $h_1$ and $h_2$.

51. In a system for locating an in-ground cable in a region using a locating signal which is transmitted from the length of the cable, a locator comprising:

a first arrangement for sensing a signal strength of the locating signal at an operator determined distance from a surface position on the ground;

a second arrangement for measuring the operator determined distance from the surface position;

a processing arrangement cooperating with the first and second arrangements and configured for accepting a first signal strength measured at a first operator determined distance generally vertically above a particular surface position on the ground which is itself generally vertically above the cable and a second signal strength measured at a second operator determined distance generally vertically above said particular surface position and configured for determining a depth of the cable using the first and second signal strength measurements and the first and second operator determined distances.

52. The locator of claim 51 wherein the second arrangement is configured for ultrasonically detecting the first and second operator determined distances to the surface of the ground.

53. The locator of claim 51 wherein the processing arrangement is configured for determining the depth of the cable using the expression

$$D_c = \frac{h_2 b_2 - h_1 b_1}{b_1 - b_2}$$

where $D_c$ is the depth of the cable, $b_1$ and $b_2$ are the first and second locating signal strengths of the locating field at the first and second operator controlled distances given as $h_1$ and $h_2$, respectively.

54. In a system for locating an in-ground cable in a region using a locating signal which is transmitted from the length of the cable, a method for determining the depth of the cable using a locator, said method comprising the steps of:

at a first point with reference to the surface of the ground, defining a generally horizontal locating direction toward a second point;

measuring a first intensity of the cable locating signal at the first point with the locator oriented toward the second point along said locating direction;

moving the locator to the second point;

measuring a second intensity of the cable locating signal at the second point;

determining a distance between the first and second points along said locating direction; and

using the measured first and second intensities and the determined distance between the first and second points, determining the depth of the cable.

55. The method of claim 54 wherein said first and second points are on one side of the cable in a plan view.

56. The method of claim 54 wherein said first and second points are on opposite sides of said cable in a plan view.

57. The method of claim 54 wherein the first and second intensities are measured along a set of three orthogonally opposed axes using said locator.

58. The method of claim 54 wherein the step of determining the depth of the cable includes the step of determining an angle $\gamma$ between a direction that is normal to the cable and the locating direction in a plan view.

59. The method of claim 58 wherein the step of determining the angle $\gamma$ includes the steps of using the first intensity of the cable locating signal to provide a horizontal flux intensity made up of a first flux component $b_{u_1}$ that is parallel to the locating direction and a second flux component $b_{v_1}$ that is normal to the locating direction and determining $\gamma$ using the expression:

$$\tan\gamma = \frac{b_{v_1}}{b_{u_1}}.$$

60. The method of claim 54 wherein the step of determining the depth of the cable includes the step of determining a total horizontal flux intensity, $b_{h_1}$, at the first point using the expression:

$$b_{h_1} = \sqrt{b_{u_1}^2 + b_{v_1}^2}$$

where $b_{u_1}$ is a horizontal flux intensity component at the first point that is parallel to the locating direction and $b_{v_1}$ is a horizontal flux intensity component at the first point that is normal to the locating direction.

61. The method of claim 54 wherein the step of determining the depth of the cable includes the step of determining a total horizontal flux intensity, $b_{h_2}$, at the second point using the expression:

$$b_{h_2} = \sqrt{b_{u_2}^2 + b_{v_2}^2}$$

where $b_{u_2}$ is a horizontal flux intensity component at the first point that is parallel to the locating direction and $b_{v_2}$ is a horizontal flux intensity component at the first point that is normal to the locating direction.

62. The method of claim 54 wherein the step of determining the depth of the cable uses the expression:

$$D_c = \frac{(\Delta s)\cos\gamma}{\frac{b_{w_1}}{b_{h_1}} - \frac{b_{w_2}}{b_{h_2}}}$$

where $\gamma$ is an angle between a direction that is normal to the cable and the locating direction, $b_{h_1}$ is a first total horizontal flux intensity at the first point, $b_{h_2}$ is a second total horizontal flux intensity at the second point, $\Delta s$ is the distance between the first and second points, $b_{w_1}$ is a vertical flux intensity component at the first point, $b_{w_2}$ is a vertical flux intensity component at the second point and $D_c$ is the depth of the cable.

63. The method of claim 54 wherein the step of determining the depth of the cable uses the expressions:

$$\tan\gamma = \frac{b_{v_1}}{b_{u_1}}$$

$$b_{h_1} = \sqrt{b_{u_1}^2 + b_{v_1}^2}$$

$$b_{h_2} = \sqrt{b_{u_2}^2 + b_{v_2}^2}\ ,\ and$$

$$D_c = \frac{(\Delta s)\cos\gamma}{\frac{b_{w_1}}{b_{h_1}} - \frac{b_{w_2}}{b_{h_2}}}$$

where $\gamma$ is an angle between a direction that is normal to the cable and the locating direction, $b_{u_1}$ is a horizontal flux intensity component at the first point that is parallel to the locating direction, $b_{v_1}$ is a horizontal flux intensity component at the first point that is normal to the locating direction, $b_{u_2}$ is a horizontal flux intensity component at the second point, $b_{v_2}$ is a horizontal flux intensity component at the second point that is normal to $b_{u_2}$, $b_{h_1}$ is a first total horizontal flux intensity at the first point, $b_{h_2}$ is a second total horizontal flux intensity at the second point, $\Delta s$ is the distance between the first and second points, $b_{w_1}$ is a vertical flux intensity component at the first point, $b_{w_2}$ is a vertical flux intensity component at the second point and $D_c$ is the depth of the cable.

64. In a system for locating an in-ground cable in a region using a locating signal which is transmitted from the length of the cable, a locator comprising:

a first arrangement for sensing a signal strength of the locating signal; and

a processing arrangement cooperating with the first arrangement and configured for using (i) a first signal strength measured at a first point with reference to the surface of the ground with the locator oriented in a generally

horizontal locating direction toward a second point, (ii) a second signal strength measured at the second point and (iii) a distance determined between the first and second points to determine the depth of said cable.

65. The locator of claim 64 wherein the processing arrangement is configured for using the first and second signal strengths as measured to one side of the cable in a plan view.

66. The locator of claim 64 wherein the processing arrangement is configured for using the first and second signal strengths as measured on opposite sides of said cable in a plan view.

67. The locator of claim 64 wherein the first arrangement is configured for measuring each of the first and second intensities along a set of three orthogonally opposed axes using said locator.

68. The locator of claim 64 wherein the processing arrangement is configured for determining an angle $\gamma$ between a direction that is normal to the cable and the locating direction.

69. The locator of claim 68 wherein the processing arrangement is configured for determining the angle $\gamma$ using the first intensity of the cable locating signal to provide a horizontal flux intensity made up of a first flux component $b_{u_1}$ that is parallel to the locating direction and a second flux component $b_{v_1}$ that is normal to the locating direction and determining $\gamma$ using the expression

$$\tan\gamma = \frac{b_{v_1}}{b_{u_1}}.$$

70. The locator of claim 64 wherein the processing arrangement is configured for determining the depth of the cable based, at least in part, on a total horizontal flux intensity, $b_{h_1}$, at the first point using the expression:

$$b_{h_1} = \sqrt{b_{u_1}^2 + b_{v_1}^2}$$

where $b_{u_1}$ is a horizontal flux intensity component at the first point that is parallel to the locating direction and $b_{v_1}$ is a horizontal flux intensity component at the first point that is normal to the locating direction.

71. The locator of claim 64 wherein the processing arrangement is configured for determining the depth of the cable based, at least in part, on a total horizontal flux intensity, $b_{h_2}$, at the second point using the expression:

$$b_{h_2} = \sqrt{b_{u_2}^2 + b_{v_2}^2}$$

where $b_{u_2}$ is a horizontal flux intensity component at the first point that is parallel to the locating direction and $b_{v_2}$ is a horizontal flux intensity component at the first point that is normal to the locating direction.

72. The locator of claim 64 wherein the processing arrangement is configured for determining the depth of the cable based, at least in part, on the expression:

$$D_c = \frac{(\Delta s)\cos\gamma}{\dfrac{b_{w_1}}{b_{h_1}} - \dfrac{b_{w_2}}{b_{h_2}}}$$

where $\gamma$ is an angle between a direction that is normal to the cable and the locating direction, $b_{h_1}$ is a first total horizontal flux intensity at the first point, $b_{h_2}$ is a second total horizontal flux intensity at the second point, $\Delta s$ is the distance between the first and second points, $b_{w_1}$ is a vertical flux intensity component at the first point, $b_{w_2}$ is a vertical flux intensity component at the second point and $D_c$ is the depth of the cable.

73. The locator of claim 64 wherein the processing arrangement is configured for determining the depth of the cable using the expressions:

$$\tan\gamma = \frac{b_{v_1}}{b_{u_1}}$$

$$b_{h_1} = \sqrt{b_{u_1}^2 + b_{v_1}^2}$$

$$b_{h_2} = \sqrt{b_{u_2}^2 + b_{v_2}^2}\text{, } and$$

$$D_c = \frac{(\Delta s)\cos\gamma}{\dfrac{b_{w_1}}{b_{h_1}} - \dfrac{b_{w_2}}{b_{h_2}}}$$

where $\gamma$ is an angle between a direction that is normal to the cable and the locating direction, $b_{u_1}$ is a horizontal flux intensity component at the first point that is parallel to the locating direction, $b_{v_1}$ is a horizontal flux intensity component at the first point that is normal to the locating direction, $b_{u_2}$ is a horizontal flux intensity component at the second point, $b_{v_2}$ is a horizontal flux intensity component at the second point that is normal to $b_{u_2}$, $b_{h_1}$ is a first total horizontal flux intensity at the first point, $b_{h_2}$ is a second total horizontal flux intensity at the second point, $\Delta s$ is the distance between the first and second points, $b_{w_1}$ is a vertical flux intensity component at the first point, $b_{w_2}$ is a vertical flux intensity component at the second point and $D_c$ is the depth of the cable.

74. In a region which includes at least one generally straight cable in the ground and extending across said region, from which cable a locating signal is transmitted, a method comprising the steps of:

measuring a local flux intensity, including three orthogonally opposed values, of the locating signal at an above

ground point within said region using a portable locator; and

using the local flux intensity to establish an approximate horizontal distance to the cable based on a vertically oriented component of the locating signal at the above ground point determined from the local flux intensity and a horizontally oriented component of the locating signal at the above ground point determined from the local flux intensity, which horizontally oriented component is generally normal to the cable in a plan view and represents a total flux intensity in a horizontal plane.

75. The method of claim 74 wherein the vertically oriented component of the locating signal is denoted as $b_w$ and the horizontally oriented component of the locating signal is denoted as $b_h$ and wherein the approximate horizontal distance is estimated based on an angle α determined by the expression:

$$\tan\alpha = \frac{b_w}{b_h} \ .$$

76. The method of claim 75 wherein the locator includes an axis of symmetry and wherein $b_h$ is given by

$$b_h = b_u\sqrt{1+\left(\frac{b_v}{b_u}\right)^2}$$

where $b_u$ is measured along the axis of symmetry of the locator with the axis of symmetry horizontally oriented and $b_v$ is measured horizontally normal thereto.

77. The method of claim 75 wherein tan α includes a sign and said method includes the step of using the sign of α to establish whether the cable is ahead of or behind the locator.

78. The method of claim 75 further comprising the step of determining an angle $\gamma$ between a direction that is normal to the cable in a plan view and the locating direction given by the expression

$$\tan\gamma = \frac{b_v}{b_u}$$

such that $\gamma$ establishes a relative direction of the cable from the locator at the above ground point with the locator oriented in the locating direction.

79. The method of claim 78 wherein said locator includes a display and wherein said method further comprises the step of displaying a positional relationship between the locator, oriented along said locating direction at the above ground point, and the cable based on $\gamma$ and α.

80. In a system for use in a region which includes at least one generally straight cable in the ground and extending across said region, from which cable a locating signal is transmitted, a locator comprising:

a first arrangement for measuring a local flux intensity, including three orthogonally opposed values, of the locating signal at an above ground point;

a processing arrangement for using the local flux intensity to establish an approximate horizontal distance to the cable in a plan view based on a vertically oriented component of the locating signal at the above ground point determined from the local flux intensity and a horizontally oriented component of the locating signal at the above ground point determined from the local flux intensity, which horizontally oriented component is generally normal to the cable in a plan view and represents a total flux intensity in a horizontal plane.

81. The locator of claim 80 wherein the vertically oriented component of the locating signal is denoted as $b_w$ and the horizontally oriented component of the locating signal is denoted as $b_h$ and wherein the processing arrangement is configured for estimating the approximate horizontal distance based on an angle α determined by the expression:

$$\tan\alpha = \frac{b_w}{b_h} .$$

82. The locator of claim 81 including an axis of symmetry and wherein the processing arrangement is configured for determining $b_h$ using the expression

$$b_h = b_u\sqrt{1+\left(\frac{b_v}{b_u}\right)^2}$$

where $b_u$ is measured along the axis of symmetry of the locator with the axis of symmetry horizontally oriented and $b_v$ is measured horizontally normal thereto.

83. The locator of claim 81 wherein the processing arrangement is configured for determining a sign of tan α and for using the sign of α to establish whether the cable is ahead of or behind the locator.

84. The locator of claim 81 wherein the processing arrangement is configured for determining an angle $\gamma$ between a direction that is normal to the cable in a plan view and the locating direction given by the expression

$$\tan\gamma = \frac{b_v}{b_u}$$

such that $\gamma$ establishes a relative direction of the cable from the locator at the above ground point with the locator oriented in the locating direction.

85. The locator of claim 84 including a display and wherein said processing arrangement is configured for determining a positional relationship based on $\gamma$ and $\alpha$ for presentation on said display, said positional relationship including the locator oriented along said locating direction at the above ground point and the cable in a plan view.

86. In a system for locating an in-ground cable in a region using a cable locating signal which is transmitted from the length of the cable, a method comprising the steps of:

using a locator, sensing a first locating signal strength at a first operator determined distance generally in vertical alignment with a surface position which is horizontally displaced with respect to any position directly overhead of the cable;

measuring the first operator determined distance from the surface position;

moving the locator to a second operator determined distance from the surface position generally in vertical alignment with the surface position;

sensing a second locating signal strength at the second operator determined distance;

measuring the second operator determined distance from the surface position;

measuring a horizontal distance from the surface position to a point directly overhead of the cable in a direction that is normal to a surface projection of the cable; and

determining the depth of the cable using the first and second locating signal strengths, the first and second distances and the measured horizontal distance.

87. The method of claim 86 wherein the step of determining the depth of the cable uses the expression:

$$\left(\frac{b_1}{b_2}\right)^2 = \frac{s^2 + (D_c + h_2)^2}{s^2 + (D_c + h_1)^2}$$

where $b_1$ is the first locating signal strength, $b_2$ is the second locating signal strength $h_1$ is the first operator determined distance, $h_2$ is the second operator determined distance, $s$ is the measured horizontal distance, and $D_c$ is the cable depth.

88. The method of claim 86 wherein the first and second signal strengths are each measured along a set of three horizontally disposed axes.

89. In a system for locating an in-ground cable in a region using a cable locating signal which is transmitted from the length of the cable, a locating arrangement comprising:

a first arrangement for sensing a signal strength of the locating signal at an operator determined distance from a surface position on the ground;

a second arrangement for measuring the operator determined distance from the surface position;

a processing arrangement cooperating with the first and second arrangements and configured for accepting a first signal strength measured at a first operator determined distance generally vertically above a particular surface position on the ground which is horizontally displaced with respect to any position directly overhead of the cable and a second signal strength measured at a second operator determined distance generally vertically above said particular

surface position and configured for determining a depth of the cable using the first and second signal strength measurements and the first and second operator determined distances.

90. The locating arrangement of claim 89 wherein the processing arrangement is configured for determining the depth of the cable using the expression:

$$\left(\frac{b_1}{b_2}\right)^2 = \frac{s^2 + (D_c + h_2)^2}{s^2 + (D_c + h_1)^2}$$

where $b_1$ is the first locating signal strength, $b_2$ is the second locating signal strength $h_1$ is the first operator determined distance, $h_2$ is the second operator determined distance, $s$ is the measured horizontal distance, and $D_c$ is the cable depth.

91. The locating arrangement of claim 89 wherein the first and second signal strengths are each measured along a set of three horizontally disposed axes.